What is claimed is:

1. A process for manufacturing half-tone phase shifting mask blanks each having a phase shifting film containing at least one half-tone film on a transparent substrate,

comprising the step of providing a target containing a metal and silicon, and carrying out reactive sputtering in an atmosphere containing a reactive gas, to form said half-tone film on said transparent substrate,

wherein the formation of the half-tone film by said reactive sputtering is carried out using, as said target, a target having a metal/silicon compositional ratio selected so as to give a predetermined optical property of the half-tone film, at a reactive gas flow rate selected from a region where a discharge characteristic is stabilized against a change in the flow rate of the reactive gas.

2. A process for manufacturing a plurality of types of half-tone phase shifting mask blanks each of which has a phase shifting film containing at least one half-tone film on a transparent substrate, the half-tone film of each blank having a different optical property,

comprising the step of providing targets containing a metal and silicon and carrying out reactive sputtering in an atmosphere containing a reactive gas, to form said half-tone film on said transparent substrate,

wherein the formation of the half-tone film by said reactive sputtering is carried out using a target selected from a plurality of targets having different metal/silicon

compositional ratios so as to give desired different half-tone film optical properties among the mask blanks, at a reactive gas flow rate selected from a region where a discharge characteristic is stabilized against a change in the reactive gas flow rate.

3. The process of claim 1 or 2, wherein the reactive gas is at least one member selected from the group consisting of nitrogen, oxygen, fluorine and compounds of these.

4. Half-tone phase shifting mask blanks manufactured by the process recited in claim 1, 2 or 3.

5. Half-tone phase shifting masks manufactured from the half-tone phase shifting mask blanks recited in claim 4.